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# Academic Achievement through Japanese, Spanish, or French: The First Two Years of Partial Immersion

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IMMERSION PROGRAMS FOR TEACHING a foreign or second language through academic content across the curriculum have generally received rave reviews from researchers, parents, and educators involved in implementing and evaluating these programs. As this school innovation has grown in the United States, it is being used as one of many possible models for school reform. The overall goal of immersion is to prepare students for life in an increasingly interdependent world that is ethnically and linguistically diverse. This article presents the evaluation results from the first two years of a new immersion program begun in the Fall of 1989 in Fairfax County Public Schools (FCPS), Fairfax, Virginia.

Three issues make this study unusual. First, the large size of the program, with 1007 immersion students in eight schools as of October 1991, provides a large enough sample to report interesting results. Only five other US immersion programs are of comparable size or larger (2). Second, the use of an Asian language, Japanese, as one of the languages of instruction in three of the immersion schools is an innovation for immersion. This program is the second one in the US to have initiated Japanese immersion, with only four other schools having implemented Japanese instruction since 1989 when this program started. Very little research has been conducted on English-speaking students acquiring academic content through a non-Roman-alphabet language. Third, this study reports results from a partial-immersion program (defined below). Many research studies have

been conducted on total immersion, but few are available on partial immersion.

## BACKGROUND FOR THE STUDY

Immersion was first developed in Canada in the mid-1960s for speakers of English (language majority students) to acquire French by being schooled in both languages. The innovation was strongly pushed by English-speaking parents who wanted their children to be bilingual so that they would have more skills to bring to the job market. Canadian immersion programs have evolved and expanded until many different variations of immersion can now be found in all provinces (13), and programs continue to multiply as parents clamor to get their children into immersion classes. In the United States, after a slow start in the 1970s, immersion has now been implemented in at least 124 schools as of 1991 (2).

*Goals of Immersion.* Among the major goals of immersion are additive bilingualism, high levels of literacy in two languages, and academic success (23). Additive bilingualism refers to the acquisition of an additional language at no cost to one's first language. This concept can best be understood by contrasting it with subtractive bilingualism, sometimes experienced by ethnolinguistic minority groups, when through societal pressures or policies, the ethnic language is slowly replaced by the national prestigious language (16). Cognitive advantages are associated with additive bilingualism, while cognitive disadvantages are associated with subtractive bilingualism (5; 7).

Students' academic success is probably the most important goal for immersion parents, as can be seen in the results of evaluations of programs in Canada (13). One consistent find-

ing across many immersion programs is that students generally do extremely well academically after four to five years in the program, at least as well as their comparison groups being schooled monolingually and often outperforming their comparison groups (13; 20). However, most students acquire native-like proficiency in listening and reading skills in the target language, but never quite reach full native-like proficiency in the productive skills of speaking and writing (3). Nevertheless, parents seem extremely satisfied and continue to support immersion programs enthusiastically for developing much better proficiency than that developed in traditional foreign language classes.

*Program Definitions.* Immersion programs vary greatly in structure, but certain terms are consistently used to refer to the amount of instruction provided in each language (total or partial) and the grade level at which the immersion experience begins (early, delayed, or late). The term "total immersion" is used in Canada to refer to starting the immersion experience with all instruction in the minority language. Then, after one to three years, the majority language is gradually introduced as a language of instruction until the two languages are each used for fifty percent of the instruction. In some cases, the formula becomes sixty percent majority language and forty percent minority language as students move into the upper grades. In contrast, "partial immersion" typically provides fifty percent of the instruction in each language from the first year of the program, giving equal instructional time to each language throughout students' schooling, or at least throughout elementary school years. For the grade level at which the immersion experience begins, Canadian programs use the term "early immersion" to refer to programs beginning in Kindergarten or Grade One, "delayed immersion" to refer to programs beginning in Grade Four or Five, and "late immersion" to refer to programs starting in Grade Seven (4; 13).

Another variation in immersion models has developed in the United States in response to the needs of language minority students. In "two-way immersion" programs, language majority and language minority students work together academically in their two languages, with the additional goals of building language minority students' self-esteem and developing positive intergroup relations. Some of these schools have served school reform efforts by

becoming magnet schools to assist with integration of students from diverse socioeconomic and ethnolinguistic backgrounds. While in Canada the term "immersion" is commonly used to refer to bilingual schools that provide full support for academic instruction in two languages for Grades K-12, in the United States, bilingual schools generally use the term "immersion" when the program is designed for language majority students, and "two-way immersion" when the program is designed for both language majority and language minority students. However, two-way immersion schools also more commonly call themselves simply "bilingual" schools, or "dual immersion," "interlocking," "developmental bilingual," or "maintenance bilingual" schools. All of these terms imply development of full academic proficiency in two languages (3; 6; 17).

#### IMPLEMENTATION DECISIONS IN FCPS

Initiated by foreign language administrative staff, with strong parent support, a decision was made to establish some foreign language classes at the elementary school level taught during the school day as an alternative to Foreign Language Experience (FLEX) classes (18) provided before or after school, leading to the eventual implementation of immersion in Fairfax County Public Schools (FCPS). Many English-speaking parents in this school district wish their children to acquire proficiency in another language because they themselves serve in jobs in the public and private sectors which make them aware of the need for increased cross-cultural understanding and competence in languages other than English. As part of the decision-making process, FCPS administrators and parents examined current research syntheses and concluded that acquiring a second language at an early age has a positive effect on intellectual growth, and leaves students with more flexibility in thinking, greater sensitivity to language, and better listening skills. The earlier and more sustained the instruction in second language, when combined with first language support, the greater the level of proficiency attained and retained by the students (1; 8; 9; 10; 13; 14).

*Early Partial Immersion.* When the decision was made to implement immersion, the immersion planners examined the variations in models of implementation and chose those models most applicable to their schools' needs. They chose to implement partial immersion in order

to satisfy parents' concerns that students receive instructional support for English from the beginning of the program, while principals felt that partial immersion would be the most effective and efficient in time, cost, and benefit to the students, and the least disruptive of staffing patterns. Early immersion was to be implemented beginning with first grade, since kindergarten for most schools was a short half day. Each year, as the students moved up in grade level, another grade would be added to the program. A few schools chose to start an immersion class in second grade in the first year of implementation; thus evaluation results from the first two years included the performance of students in Grades One, Two, and Three. Each school gave parents a choice between immersion or monolingual classes so that only a portion of the student body participated in immersion.

*Choice of Languages & Subjects of Instruction.* The next decisions involved choice of target language to be taught at each pilot school and the subjects in which instruction in the target language would be conducted. After a lengthy process of meetings with principals, staff, and parents of those elementary schools interested in the innovation, eight schools were chosen to be the pilot sites, with instruction to be conducted in Spanish at four schools, Japanese at three schools, and French at one school. One of the eight schools chosen had a sizable language-minority student population, with Spanish-speaking students the largest language group represented among the student body; thus the immersion classes at this school became two-way classes taught in Spanish and English. The subjects of mathematics, science, and health were chosen to be taught entirely in the target language, with English language arts and social studies taught during the English half of the day. To meet the curricular demands of the school district for each grade level in the subject areas of instruction in the target language, no formal language instruction (e.g., Spanish language arts) was taught in the target language in Grades One, Two, and Three; instead, students were expected to acquire oral proficiency in the target language subconsciously through math, science, and health activities. Formal target language instruction was planned for the upper elementary grades.

*Team Teaching & Staff Development.* An important part of the implementation process was providing staff development and preparation time for team teaching. The administrative

model was most cost-effective with an English-speaking teacher and a teacher proficient in the target language teaming together to instruct two groups of students, one group during each half of the school day. The teaming included planning for implementation of the school district's standard curriculum for each grade level, integration of concepts taught during both portions of the school day, and incorporation of a bicultural perspective into each concept taught. Bilingual teachers hired for the immersion program were required to be proficient in the target language and to have certification to teach the lower elementary grades. All staff were given a course on methods of teaching in elementary foreign language immersion and were encouraged to participate in summer curriculum development, an annual immersion summer institute, professional conferences, and immersion in-service training.

*Student Enrollment.* Enrollment in the program was by choice of the parents. Parent response was overwhelming, and for those schools in which the number of applications exceeded the places available, a computer lottery was used to select students randomly. Students who were not selected were placed on a waiting list in the order of the random list generated by the computer lottery. Priority for enrollment was given to native speakers of the target language, siblings of students in the program, and students residing within the attendance area of each pilot school.

#### METHOD

This study utilized a non-equivalent control group design, comparing the immersion students to a similar group of non-immersion students who were matched with the immersion students on ability as measured by the Cognitive Abilities Test. Thus the immersion students' performance in mathematics and English language arts achievement was compared to that of a group of non-immersion students of very similar ability over a two-year period. In addition, the immersion students' oral proficiency development in the target language was examined. Additional questions were addressed in the evaluation, but are not presented here due to limited space. The research questions for this study were:

1. What was the level of academic achievement in mathematics for students in the partial-immersion program, at the end of each school year, in comparison to a matched group of

FCPS peers not attending immersion classes and in comparison to the FCPS mean?

2. What was the level of academic achievement in English language arts for students in the partial-immersion program, at the end of each school year, in comparison to a matched group of FCPS peers not attending immersion classes, in comparison to the FCPS mean, and in comparison to national norms?

3. What was the level of oral proficiency in the target language (Spanish, Japanese, or French) for students in the partial-immersion program, at the beginning and end of each school year?

#### DATA COLLECTION

*Subjects.* Data was collected from the 719 students attending Grades One, Two, and Three in the partial-immersion program as of May 1991. Parents were given the choice of placing their children in the immersion program, resulting in the subjects' self-selection rather than random selection. In schools with an excess of student volunteers, participants were selected randomly by computer lottery. For this study, it was expected that the students who chose to participate in the immersion program might be of higher-than-average ability. For this reason, a comparison group was carefully chosen, matched by scores on the first grade Cognitive Abilities Test, as well as by socioeconomic status (free or reduced-price lunch), by ethnic group membership, and by primary language. In this way, any bias in favor of the immersion group due to the matched variables could be controlled by comparing the immersion group to a very similar comparison group.

By ethnic background, 79.4 percent of the 719 immersion students were white, 8.8 percent Hispanic, 6.9 percent Asian, and 4.9 percent black. Nine percent of the immersion students used a primary language other than English at home (seven percent were Spanish-speaking, and two percent were from homes in which Chinese, French, Korean, Farsi, Urdu, or Vietnamese was spoken). Immersion students receiving free or reduced-price lunch represented 6.5 percent of the total immersion student group during the first two years of the program.

*Test Descriptions.* Three outcome measures were used: the FCPS Program of Studies (POS) Mathematics Test, the Metropolitan Achievement Test (MAT) in Reading, and the Student Oral Proficiency Rating (SOPR). The Program

of Studies (POS) Mathematics test is a locally developed criterion-referenced test with a different version for each grade level, fully tested for reliability and validity. It was given to the immersion students at the end of the school year in Grades One, Two, and Three to measure their progress in mastery of the FCPS mathematics objectives for each grade level. This test not only measured the immersion students' mastery of the mathematics objectives but also their ability to transfer that knowledge to the English language, as all instruction in mathematics in the immersion classes was provided only in the target language. The first two sections of the test were administered in English and the third section was administered in the target language. This provided measures of their mathematics performance in both English and the target language.

The Metropolitan Achievement Test (MAT) in Reading is a national standardized norm-referenced test designed to assess English language arts achievement. It was given to the immersion students at the end of the school year in Grades Two and Three to measure their progress in mastery of English language arts skills in reading for their grade level. Given that immersion students received only half a day of instruction in English, it was very important to have a measure of their English language development in comparison to their peers, who were receiving all their instruction in English.

The Student Oral Proficiency Rating (SOPR) was used at the beginning and end of each school year to measure immersion students' development of oral proficiency in the target language (Spanish, French, or Japanese). This test is a standardized performance measure, using teacher judgment on a rating scale from 0 to 25, with 0 representing no proficiency in the target language and 25 representing full proficiency at the level of a native speaker. Each of five categories—comprehension, fluency, vocabulary, pronunciation, and grammar—are described in the rating scale at five levels of development. Scores 1–5 represent the first level of target language acquisition; Level Two: scores 6–10; Level Three: scores 11–15; Level Four: scores 16–20; and Level Five: scores 21–25.

*Comparison Groups.* The evaluation compared the performance of the immersion group to three comparison groups. These groups included a local sample of FCPS students comparable to those in the immersion program (a local comparison group), a group based on the

typical performance of FCPS students expressed by FCPS mean test scores (a district-wide comparison group), and a group based on the performance of students nationwide (a national comparison group) as described by national norms and reported in Normal Curve Equivalent scores (NCEs). Both one-year and two-year program effects are reported in these comparisons.

The performance of the 719 immersion group students on the Metropolitan Achievement Test is described in terms of scaled standard scores and is compared with the performance of the local comparison group, the mean FCPS scaled scores for each grade, and the national average scaled scores for each grade. Each of these scaled score means is converted to NCEs.

The local comparison group, consisting of 1320 students and selected from records of all students attending FCPS, was carefully chosen by a process of matching immersion students' scores on the Cognitive Abilities Test (COGAT) taken in first grade with FCPS students at the same grade levels with similar first grade COGAT scores who were not attending immersion classes. In addition, great care was taken to match both groups by percentage of students of varied ethnic backgrounds, by primary language (to include English as a Second Language students in the same proportion to native English speakers in both the comparison and immersion groups), and by percentage of immersion and comparison students receiving free/reduced-price lunches provided by FCPS.

## RESULTS

Research evidence from total-immersion and partial-immersion programs for language majority students, as well as bilingual programs for language minority students, has shown that students being instructed in two languages do not generally achieve academically at the same level as those being instructed in one language during the first two or three years while they are developing skills in the second language. By the third or fourth year, immersion/bilingual program students typically begin to catch up, and by the fifth year they begin outperforming all comparison groups and remain high academic achievers throughout their schooling (5; 8; 10; 13; 15). Since the students in the FCPS immersion program had chosen to be in these classes and parent expectations were high, it was very important to analyze these students' perfor-

mance not only in comparison to national norms and to the school district's typical performance, but also in comparison to a matched group similar in ability, as measured by their performance on the Cognitive Abilities Test when they entered first grade.

In the following tables presenting the students' performance in mathematics, English language arts, and oral proficiency in the target language, the immersion group and the matched comparison group are compared in mathematics for Grades One, Two, and Three, and in English language arts for Grades Two and Three. Results after one year in the immersion program are presented separately from results after two years in the program.

In each table, means, standard deviations, and number of cases are reported for the immersion group, the matched comparison group, and the FCPS mean. Following each table of results, the differences in scores between the immersion group and the matched comparison group are evaluated in terms of statistical significance and practical significance. Results are considered statistically significant when the probability ( $p$ ) reported is less than .01, indicating that there is a less than one percent possibility that the observed results were caused by chance.

Statistical significance can be highly influenced by sample size. For example, a large sample size can yield a finding of statistical significance even when the actual differences between the compared groups are quite small and are of no actionable (or practical) consequence. For this reason, a measure of practical significance is also provided. Practical significance is evaluated using a measure of effect size. This measure is defined as the fraction of the comparison group's standard deviation represented by the difference between the immersion group and comparison group means. In this study, effect sizes of .25 (indicating that the immersion group scored one-fourth of a standard deviation higher than the matched comparison group) and above are considered differences that have practical significance and that represent real changes in performance that deserve attention by interested parties. Effect sizes greater than zero but less than .25 are considered small positive effects associated with the immersion group but ones that probably have no practical significance at this point.

*Mathematics Achievement.* Tables I and II summarize the results of student performance on the Program of Studies Mathematics Test after

TABLE I  
Immersion Program Effects on Student Performance in Grade 1 (1990–1991): POS Math, Grade 1, after One Year in Spanish, Japanese, or French Immersion

	Mean Pct Correct	Mean Raw Score	Standard Deviation	Number of Cases
Immersion	89.8	48.5	4.563	617
Comparison	90.6	48.9	4.278	1124
FCPS mean	89.0	47.8	N/A	9685

TABLE II  
Immersion Program Effects on Student Performance in Grade 2 (1990–1991): POS Math, Grade 2, after One Year in Japanese Immersion

	Mean Pct Correct	Mean Raw Score	Standard Deviation	Number of Cases
Immersion	92.8	68.6	4.251	75
Comparison	88.9	65.8	6.794	540
FCPS mean	86.0	63.5	N/A	9856

one year of partial immersion. After one year in immersion classes in which all instruction in mathematics was given in the target language (Spanish, French, or Japanese), the immersion students achieved slightly higher than the FCPS raw score mean on the Program of Studies, Grade One, Mathematics Test (POS1).

While they scored slightly lower than the comparison group, the difference is not statistically significant ( $F = -3.79$ ,  $df = 1$ , 1739,  $p < .0515$ , effect size =  $-.10$ ). Statistically speaking, these are comparable scores and reveal no significant difference between the groups in their POS1 performance. These results, after one year of the immersion program, represent the only test in which the immersion students scored slightly lower than the comparison students.

All students who began the program in second grade were in the Japanese immersion classes. After one year in the immersion program, they scored significantly higher on the POS2 than either the typical FCPS student or the comparison group; the immersion raw score mean was equivalent to a score of 92.8 percent correct, the comparison mean 88.9, and the FCPS mean 86.0.

The difference in performance between the raw score means of the immersion group and the comparison group is statistically significant in favor of the immersion group ( $F = 24.45$ ,  $df = 1$ , 613,  $p < .00000149$ , effect size =  $.42$ ). This finding is very important, since little research has previously been conducted on the

acquisition of academic subjects through a non-Roman-alphabet language. The results of this evaluation, to be reported below, demonstrate that the Japanese immersion students made the same or greater gains as their counterparts in Spanish and French immersion on all measures in English language arts and mathematics.

Tables III and IV summarize the longitudinal results of student performance on the POS Mathematics Test after two years of program participation. After two years in immersion classes, the immersion students achieved at the same level as the comparison group on the POS2 in mathematics and three percentage points higher than the FCPS mean.

While no statistically significant difference exists between the performance of the immersion group and the comparison group ( $F = -0.0002$ ,  $df = 1$ , 811,  $p < .986$ , effect size =  $.0013$ ), both the immersion and comparison groups scored significantly above the FCPS mean.

After two years of program participation, the Japanese immersion students achieved slightly higher on the POS3 than the comparison group and 3.7 percentage points higher than the FCPS mean.

While the difference in performance of the immersion and comparison groups is not statistically significant ( $F = 1.13$ ,  $df = 1$ , 170,  $p < .289$ , effect size =  $.15$ ), the Japanese immersion students' performance is significantly higher than the FCPS mean.

To summarize mathematics achievement, the

TABLE III  
Immersion Program Effects on Student Performance in Grades 1–2 (1989–1991): POS Math, Grade 2, after Two Years in Spanish, Japanese, or French Immersion

	Mean Pct Correct	Mean Raw Score	Standard Deviation	Number of Cases
Immersion	89.0	65.8	7.068	273
Comparison	88.9	65.8	6.794	540
FCPS mean	86.0	63.5	N/A	9856

TABLE IV  
Immersion Program Effects on Student Performance in Grades 2–3 (1989–1991): POS Math, Grade 3, after Two Years in Japanese Immersion

	Mean Pct Correct	Mean Raw Score	Standard Deviation	Number of Cases
Immersion	79.7	48.2	5.813	74
Comparison	78.5	47.1	7.181	98
FCPS mean	76.0	45.3	N/A	9577

immersion students did as well as or better than their comparison group in all three grade levels in which the immersion program was implemented for 1989–1991. In addition, the immersion group achieved at levels higher than the FCPS mean on all levels: POS1, POS2, and POS3. This accomplishment is significant, since all math instruction was given in the target language, in which most students had no proficiency at the beginning of the program. The immersion students in FCPS performed at levels higher than typical in the first two years of an immersion program. Usually, significant gains are not seen until the third or fourth year of a program (5; 8; 10; 13; 15).

*English Language Arts Achievement.* Tables V and VI summarize the longitudinal results of student performance on the Metropolitan Achievement Test (MAT). Since the MAT is only given in grades Two and Three, the immersion students' performance is reported in those grades, after two years of program participation. On the MAT2, the two-year immersion students significantly outperformed both the comparison group and the FCPS average, with the immersion students scoring at the 68th NCE on the MAT2, the comparison group at the 62nd NCE, and the FCPS mean at the 64th NCE.

A statistically significant difference exists between the performance of the immersion group and the comparison group, in favor of the immersion group ( $F = 9.98$ ,  $df = 1$ , 725,  $p < .0016$ , effect size = .24).

After two years of program participation, the Japanese immersion group scored at the 69th NCE on the MAT3, the comparison group at the 67th NCE, and the FCPS mean at the 61st NCE.

While no statistically significant difference exists between the performance of the immersion group and the comparison group ( $F = 0.52$ ,  $df = 1$ , 174,  $p < .47$ , effect size = .11), the immersion students are more than one-third of a standard deviation above the achievement of the FCPS mean.

Again, the high scores represent a significant accomplishment for the immersion students, as they only receive half of their instructional day in the English language, while the comparison group and all other FCPS students receive a full day of instruction in English. The results support many other research studies which show that developing bilinguals typically become metalinguistically aware at an earlier age and are able to use their expanded knowledge from the process of developing a second language to analyze their own first language (14; 19; 21). Thus, even though the immersion students receive less formal instructional support in English, they can apply the knowledge they gain in the target language to analysis of their first language.

*Target Language Proficiency.* The main goal of the immersion program during the first two years of instruction in math, science, and health through the target language was to begin development of oral proficiency in the target lan-

TABLE V  
Immersion Program Effects on Student Performance in Grades 1–2 (1989–1991): MAT, Grade 2, after Two Years in Spanish, Japanese, or French Immersion

	Mean Scaled Score	Standard Deviation	Number of Cases	NCE	Percentile
Immersion	603.0	53.338	281	67.7	80
Comparison	590.1	53.130	446	62.3	72
FCPS mean	594.4	48.900	2849	63.9	74

TABLE VI  
Immersion Program Effects on Student Performance in Grades 2–3 (1989–1991): MAT, Grade 3, after Two Years in Japanese Immersion

	Mean Scaled Score	Standard Deviation	Number of Cases	NCE	Percentile
Immersion	645.3	49.288	74	68.7	81
Comparison	640.0	46.790	102	66.6	78
FCPS mean	626.8	49.200	2659	61.0	70

TABLE VII  
Immersion Program Effects on Student Performance in Target Language (1989–1991): SOPR Scores through Two Years of Spanish, Japanese, or French Immersion Classes

Sept. 1989		May 1990		Oct. 1990		May 1991	
Mean	Median	Mean	Median	Mean	Median	Mean	Median
0	0	8.1	7	11.1	10	14.1	14

Number of cases = 234

Maximum score = 25

guage at no cost to the students' academic achievement in English. Since the students are clearly outperforming their comparison groups in both English mathematics and English language arts, any gains that they also make in development of target language proficiency can be seen as an added bonus. Formal instruction in reading and writing the target language was not an explicit goal of the first two years of the immersion program; therefore, for this first stage, only a standardized test of oral proficiency was chosen to measure acquisition of the target language. In future evaluations, a measure of written proficiency in the target language will be added.

The longitudinal results of the Student Oral Proficiency Rating (SOPR), presented in Table VII, demonstrate the immersion students' progressive development of their oral skills in the target language during the first two years of their program participation.

In September 1989, all of the English-

speaking students were at 0 proficiency level on the SOPR rating scale of 0–25, with no proficiency in the target language. By the end of the first year of instruction, during which they acquired the second language through lessons in math, science, and health with no explicit teaching of the target language, the immersion students had reached a median score of 7 on the SOPR. At this level (Level Two, ranging from 6–10 on the SOPR), the immersion students could comprehend social conversation, teacher directions, and follow general activities in the target language. At Level Two, they began to emerge from the silent period (a stage in child second language acquisition when the child is rapidly acquiring listening comprehension skills in the target language but is not yet ready to begin producing the language at any significant level; the silent period can last anywhere from three months to one year; see 11; 12; 22). At Level Two, as the immersion students began to experiment with speaking in the



target language, although as expected they made many errors in speech, they started to use the language more and more.

By October of the second year of instruction, the students had begun moving into Level Three, which is the mid-range of proficiency development, with a score on the SOPR of 11–15. By the end of the second year of instruction, they reached a median of 14, which represents the upper end of Level Three. At this level, they understood most of what was said, participated significantly in speaking in the target language, and demonstrated mastery of quite a range of vocabulary needed for the math, science, and health activities of the curriculum. They were expected to and continued to make grammar errors that generally did not affect the flow of communication. At this level, the students had made substantial progress toward development of native speaker oral proficiency, as measured by the SOPR instrument. This progress is a laudable accomplishment for oral proficiency development during the first two years of the program. Caution must be taken, however, when interpreting these results, as the SOPR instrument was designed to measure general proficiency development over time using performance criteria. The numerical ratings probably do not reflect a linear scale with intervals representing equal amounts of proficiency across the scale, but rather an ordinal scale representing ranked levels of increasing proficiency.

The grammatical criteria used in the SOPR scale for general measurement of oral proficiency development reflect the theoretical position in current second language acquisition (SLA) research that for young children, instructional focus on grammatical accuracy in the early stages of SLA is less important than focus on use of the language for meaningful academic purposes. However, for the upper elementary grades, the FCPS program planners intend to introduce formal language arts instruction in the target language with conscious focus on development of grammatical accuracy. At this age level, students have reached the developmental stage (e.g., Piaget's formal operations) in which they are able to undertake abstract analysis of the language (3; 8; 9; 11; 13; 15).

Writing samples were collected in the Spring of 1991 using a standardized procedure for collection of the samples, which will serve as a base line measure for future assessment of writing proficiency in the target language. These writ-

ing samples demonstrate the students' growing awareness of print patterns in the target language, even though they have not yet had formal instruction in writing in the target language. In other words, they have acquired through natural language acquisition some of the conventions of the written form of the language.

#### CONCLUSIONS

Overall, the students participating in the immersion program scored at least as well as, and to some extent better than, comparable FCPS students who were not in the program. No evidence exists that the students' academic and cognitive development has been slowed in any way by their immersion experience. Some evidence, at times significant, indicates that their performance in English and in the content areas has been enhanced during the past two years when compared to non-participating students of similar ability and characteristics.

The immersion students did at least as well as or better than their comparison group on mathematics achievement in Grades One, Two, and Three. The immersion students performed at levels higher than typical immersion student performance after the first two years of an immersion program, even though all instruction in mathematics was presented in the target language (Japanese, Spanish, or French).

In English language arts achievement, immersion students significantly outperformed their comparison group after two years of immersion program participation, with scores at the 68th NCE (80th percentile) on the MAT2. On the MAT3, Japanese immersion students slightly outperformed their comparison group at the 69th NCE (81st percentile), and the Japanese immersion group scored more than one-third of a standard deviation above the FCPS mean. Altogether, this achievement is remarkable, given that immersion students only received half a day of formal instruction in English, and that immersion students in three of the eight immersion schools received half a day of instruction in a non-Roman-alphabet language. One implication might be that this achievement represents evidence of some transfer of skills from Japanese, Spanish, or French to English.

In target language proficiency, the immersion students made steady progress toward oral proficiency in the target language, reaching the

upper end (Level Fourteen) of the mid-level proficiency range (Levels Eleven to Fifteen on the twenty-five-point SOPR scale) by the end of the second year. This progress toward oral proficiency development in the target language is excellent, acquired through natural language acquisition in math, science, and health curricular activities, with no formal language instruction in the target language.

Both the immersion and comparison groups outperformed the FCPS means on all measures. FCPS means on standardized measures are well

above national norms. Given that the immersion and comparison groups were carefully matched by COGAT (Cognitive Abilities Test) score, by socioeconomic status, by ethnic group membership, and by primary language, and can thus be truly considered to be comparable groups, the higher immersion group achievement is a real accomplishment. Future studies will monitor these students' continuing progress in target language proficiency and academic achievement.

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#### BIBLIOGRAPHY

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1. California State Department of Education. *Studies on Immersion Education: A Collection for United States Educators*. Sacramento, CA: California State Dept. of Education, 1984.
2. Center for Applied Linguistics. *Total and Partial Immersion Language Programs in US Elementary Schools*. Washington: CAL, 1991.
3. Collier, Virginia P. "The Canadian Bilingual Immersion Debate: A Synthesis of Research Findings." *Studies in Second Language Acquisition* 14 (1992): 87-97.
4. ———. "Education: Bilingualism." *The Americana Annual, 1989: Yearbook of the Encyclopedia Americana*. Danbury, CT: Grolier, 1989: 211-12.
5. ———. "How Long? A Synthesis of Research on Academic Achievement in Second Language." *TESOL Quarterly* 23 (1989): 509-31.
6. Crawford, James. *Bilingual Education: History, Politics, Theory, and Practice*. Trenton, NJ: Crane, 1989.
7. Cummins, Jim. "The Role of Primary Language Development in Promoting Educational Success for Language Minority Students." *Schooling and Language Minority Students: A Theoretical Framework*. Sacramento, CA: California State Dept. of Education, 1981: 3-49.
8. ——— & Merrill Swain. *Bilingualism in Education*. New York: Longman, 1986.
9. Curtain, Helena A. & Carol Ann Pesola. *Languages and Children—Making the Match: Foreign Language Instruction in the Elementary School*. Reading, MA: Addison-Wesley, 1988.
10. Dolson, David P. *The Application of Immersion Education in the United States*. Washington: National Clearinghouse for Bilingual Education, 1985.
11. Dulay, Heidi, Marina Burt & Stephen Krashen. *Language Two*. New York: Oxford Univ. Press, 1982.
12. Enright, D. Scott. "Use Everything You Have to Teach English: Providing Useful Input to Young Language Learners." *Children and ESL: Integrating Perspectives*. Ed. Pat Rigg & D. Scott Enright. Alexandria, VA: TESOL, 1986: 113-62.
13. Genesee, Fred. *Learning through Two Languages: Studies of Immersion and Bilingual Education*. Cambridge, MA: Newbury House, 1987.
14. Hakuta, Kenji. *Mirror of Language: The Debate on Bilingualism*. New York: Basic, 1986.
15. Harley, Birgit, Patrick Allen, Jim Cummins & Merrill Swain. *The Development of Second Language Proficiency*. New York: Cambridge Univ. Press, 1990.
16. Lambert, Wallace E. "An Overview of Issues in Immersion Education." *Studies on Immersion Education: A Collection for United States Educators*. Sacramento, CA: California State Dept. of Education, 1984: 8-30.
17. Lindholm, Kathryn J. *Directory of Bilingual Immersion Programs: Two-Way Bilingual Education for Language Minority and Majority Students*. Los Angeles: Center for Language Education and Research, Univ. of California, Los Angeles, 1987.
18. Lipton, Gladys C. *Practical Handbook to Elementary Foreign Language Programs: Including FLES, FLEX, and Immersion Programs*. Lincolnwood, IL: National Textbook, 1989.
19. McLaughlin, Barry. *Second Language Acquisition in Childhood: Volume 1. Preschool Children*. 2nd ed. Hillsdale, NJ: Erlbaum, 1984.
20. Safty, Adel. "French Immersion and the Making of a Bilingual Society: A Critical Review and Discussion." *Canadian Journal of Education* 13 (1988): 243-62.
21. Thonis, Eleanor W. "Reading Instruction for Language Minority Students." *Schooling and Language Minority Students: A Theoretical Framework*. Sacramento, CA: California State Dept. of Education, 1981: 147-81.
22. Ventriglia, Linda. *Conversations of Miguel and Maria: How Children Learn a Second Language: Implications for Classroom Teaching*. Reading, MA: Addison-Wesley, 1982.
23. Wink, Joan. "Immersion Confusion." *TESOL Matters* 1 (December 1991/January 1992): 14, 17.